Space Weather Forecast

Issued on Tuesday, 01 February 2022 at 01:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1-G2 Minor to Moderate Storms likely day 2 (02 February) from CME arrival. Chance M-flares (R1/R2 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Low solar activity with a number of Common class flares observed. These were mainly from two regions close to the eastern limb and the large region in the northwest quadrant. There are also two smaller, simpler and benign regions on the visible disc. No Earth-directed CMEs (coronal mass ejections) were observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind started the period at elevated levels, but has since declined to slightly elevated values. Magnetic field strength was also weak. The important north-south component initially pointed weakly southward, but became positive later in the period. Geomagnetic Activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Low solar activity is expected through the period, with a chance if Moderate-class flares, and a very slight chance of a Strong flare.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 29 January is due to arrive at Earth either late on 01 or during 02 February. Solar wind speeds will decline to background levels on 01 February, prior to any CME enhancements. A further fast wind could then connect with the Earth on 04 February. Geomagnetic activity will start Quiet to Unsettled, but will become Active due to the CME arrival, with a likelihood of G1 or G2 (minor or moderate storm) intervals. There is also a slight chance of G3 strong storms. Activity should then decline on 03 February, with a further risk of G1/Minor Storms on day 4 due to the connection with a fast solar wind.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to most likely remain at background levels, however there is a chance of this increasing in response to any significant flares from the large sunspot. No radiation storms are currently expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	60	20	30
Strong	G3	No	5	15	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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